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ABSTRACT

The American Council on Education has been conducting a longitudinal research study to assess the impact of different college environments on the student's development and to provide a source of current, readily available, descriptive information about the student population. The findings presented in this paper are based on the followup of the 1967 freshmen, conducted in 1968 after the completion of their freshmen year in college. The data was obtained from 26,806 freshmen in 178 institutions. The institutions were divided into 9 types, and this paper is primarily concerned with presenting a comparative analysis of the impact of each of these institutional types on the student's attitudes, grade point average, and values during the first year in college. (AF)

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College Impact on Student Attitudes and Behavior¹

Social scientists have been attempting to study the impact of colleges for a number of years, but until recently most of this research has been severely handicapped by methodological problems. For example, a great many studies were carried out only at single institutions. Although such studies may produce interesting information, they are of limited scientific value; they resemble an experiment without a control group. There is no way of determining if the change that is observed in the student at a particular institution would have occurred if he had attended some other type of institution or no institution at all.

The limitations of single-institution studies led some investigators to undertake comparative studies of several institutions, but these multi-institutional studies present certain other methodological problems. Students

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are not distributed randomly among institutions. On the contrary, particular types of students are attracted to particular types of institutions. Under these circumstances, variations from one college to another in the attitudes or behaviors of their graduates may result from differences among student bodies that existed prior to matriculation, rather than from the impact of the institutions themselves. In other words, variations in the student outputs of different institutions are difficult to interpret unless one also has information concerning their student inputs. In short, the nonrandom character of student inputs requires that multi-institutional studies deal with student input as well as student output data. Longitudinal studies, then, are necessary.

The need for controlling differential student inputs in comparative institutional studies is well illustrated by the history of research on institutional "Ph.D. productivity." The earliest of these studies indicated that graduates of certain colleges and universities were much more likely than were the graduates of other institutions to win fellowships for graduate study and to go on to obtain the Ph.D. degree. The highly productive institutions were found to have higher faculty-student ratios, larger libraries, and more funds for research. The authors of these early studies concluded that such institutional resources are conducive to the development of the student's motivation to seek advanced training. Taken at face value, these findings offer empirical support to the administrators' attempts to increase the size of their libraries, faculties, and similar institutional resources.

The validity of these earlier studies came to be doubted, however, when it was shown that institutions differ widely in their student inputs:

Relatively highly productive institutions, for example, usually enroll high proportions of academically able students. Such students are, of course, more likely than average students both to win graduate fellowships and to be interested in pursuing a doctorate upon graduation, even if their institutions exert no special influence during the undergraduate years. These doubts about the early studies were subsequently confirmed by a series of longitudinal studies, in which the differential inputs of undergraduate students were controlled statistically. Thus, when the abilities, career plans, and background characteristics of the entering students were taken into account, an institution's output of Ph.D.s was revealed to be largely a function of the characteristics of its entering students rather than of its institutional resources. Moreover, certain types of institutions that were earlier thought to be "highly productive" of Ph.D.s turned out to be underproductive in relation to their student inputs. In addition, the apparent "effects" of library size, faculty-student ratio, and research funds disappeared when student inputs were controlled.

Most of us participating in this panel were selected because we had been associated with higher education research programs which involve several institutions as well as longitudinal data. The program with which I am associated at the American Council on Education has been in operation since 1965. The major objectives of this program are to assess the impact of different college environments on the student's development and to provide a source of current, readily available descriptive information about the population of colleges and students. The general plan of the program is to collect data from freshmen when they first enter college, and to collect longitudinal followup data at periodic intervals thereafter.

In order to represent the diversity of the higher educational system as completely as possible, we have attempted to select a stratified random sample from the total population of institutions. Types of institutions which are very numerous are undersampled, and types which are not very plentiful are oversampled. Compensatory weights are applied to the data in order to simulate population statistics.

Table 1 summarizes the numbers of students and institutions that have participated in our program to date. We have tried to keep the number of institutions somewhere near 350, and we encourage the institutions to participate annually in order to maximize comparability from year to year. However, since each new class of entering freshmen begins a new longitudinal study, the number of students grows linearly with time. We now have freshman data on well over one million students. However, in order to keep costs down, we follow up only random samples of students from the larger institutions. A typical followup for a given cohort of entering freshmen would involve 75,000 students, or about 250 students in each of 300 institutions. Notice that our most "followed-up" group is the 1966 freshmen, who received their third followup this past summer.

The findings that I would like to present today were based on the followup of the 1967 freshmen that was conducted in 1968 after the completion of their freshman year in college. The input data for this sample consisted of the students' responses to about 150 items from a questionnaire completed at the time of matriculation, in addition to information on high school aptitude test scores provided by the institutions. Longitudinal followup data was obtained one year later by means of a mailed questionnaire. Institutions also provided some followup data on the students' freshman grade

point average and dropout status as of the fall of 1968.

Because of several technical and logistical factors, the number of institutions for which we had usable longitudinal data was only 178. Longitudinal data were available for a total of 26,806 students at these institutions, or an average of about 150 students per institution.

Table 2 shows the numbers of institutions of various types and the total numbers of students for whom we had longitudinal data. The findings that I shall report today will be confined to a comparative analysis of the impact of each of these nine institutional types on the students' attitudes and values during the first year of college.

There were a total of 48 dependent variables in these analyses, including 28 items concerning the student's observable behaviors during his freshman year, 15 items reflecting his attitudes on various issues, an item concerning his degree of satisfaction with the freshman year in college, his freshman grade point average (GPA), and his dropout status after the first year of college. The behavioral and attitudinal items were included in the freshman questionnaire as well as in the followup questionnaire administered one year later.

To illustrate the procedures that were followed with each of these dependent variables, I have reported in Table 3 the details of one analysis, using a dependent variable with which most of us are familiar: the student's freshman GPA. A total of 85 student input variables, including most of the items in the freshman questionnaire as well as high school test scores provided by the institutions, were permitted to enter the stepwise regression analysis until no additional variable was capable of producing a reduction of the residual sum of the squares exceeding $p = .05$. Table 3 shows the

first 15 input variables that entered the regression analysis for freshman GPA (to conserve space I have omitted five additional input variables that entered at a borderline level of significance -- $.05 > p > .01$). The first column of coefficients in Table 3 shows the size of the multiple regression coefficients at each stage in the analysis. The next column of data shows the F ratio associated with the reduction in the residual sum of squares that is uniquely attributable to each input variable in the final regression equation. Not surprisingly, the most important predictors of the student's freshman GPA are two familiar variables that crop up in almost any grade prediction study: the student's grades in high school and his scores on tests of academic ability. The other variables that enter the prediction, although of substantially less importance than grades and test scores, are nevertheless intriguing. The last two variables, for example, suggest that grading practices in the fields of engineering and biological sciences are more stringent than grading practices in other fields (note the two negative weights associated with these input variables). Also, four of the other input variables -- #3, 4, 11, and 12 -- are concerned with the student's stated reason for attending his college; these may in fact reflect the impact of academic selectivity on the student's freshman grades. (The relationship of selectivity to academic performance has been established in earlier studies; see, for example, Astin, 1971.) Variable #4, academic reputation, is of particular interest, since the sign of the regression coefficient associated with this variable is negative whereas the sign of the zero-order correlation of this variable is positive. What this reversal means is that students who select their college because of its academic reputation tend to get higher grades than other students,

but their grades are in fact lower than would be expected from their high school grades and aptitude test scores. A likely explanation for this finding is that students who place a high value on the reputation of their colleges are likely to attend relatively selective ones. Since these selective colleges have more stringent grading practices, the student actually ends up getting somewhat lower grades than he would have gotten at a less selective college; thus, the negative coefficient.

In order to assess the impact of different types of institutions on the student's GPA, we computed an "expected" GPA for each student based on the regression analysis reported in Table 3. These expected GPAs were then averaged separately within each of the nine types of institutions. The mean expected freshman GPAs are shown in Table 4, together with the mean actual GPAs obtained by the students during their freshman year. Note that in the two-year colleges, both in public and private alike, the students obtain significantly higher grades than would be predicted from their input characteristics. In simpler terms, one might say that these two-year institutions have easier grading standards than most other types of institutions. By contrast, in technological institutions, Roman Catholic and private-nonsectarian four-year colleges, and public universities, the actual grades of students are below what would be expected from their input characteristics. Actual and expected grades do not differ significantly in public or Protestant four-year colleges or in private universities. The positive impact of the two-year colleges on the student's freshman grades is particularly interesting in view of the fact that the actual grades earned by the students at two-year institutions tend to be lower than the actual grades earned by students at most other types of institutions. Thus,

although students tend to earn low grades in the two-year colleges, their grades are still higher than would be predicted from their background characteristics.

An analysis similar to the one just described for freshman GPA was carried out separately for each of the 47 other dependent variables. Rather than presenting each of these analyses separately, I have attempted to summarize them in the next three tables. Table 5 shows the results of the regression analyses involving the 28 behavioral items. The first two columns of data show the mean scores obtained on each item by the students at the time they entered college in 1967, and one year later after completion of the freshman year. Although many of the means show little change over the one-year interval, some shifts are worth noting. The largest single increase was in the frequency with which students overslept and missed classes or appointments. Smaller increases occurred in participation in demonstrations, studying with other students, cigarette smoking, and beer drinking. A slight increase in the frequency of political discussions was accompanied by a small decrease in frequency of discussions about sports. The most marked decreases occurred in being absent from school because of illness, visiting art galleries or museums, riding motorcycles, taking long trips, playing chess, and taking vitamins. It was somewhat surprising to find also a decline in the frequency with which students were guests in a teacher's home.

The next column of coefficients in Table 5 shows the zero-order correlation between the students' 1967 and 1968 responses to each item. By far the most stable response is in cigarette smoking, followed by discussions about sports, beer drinking, playing chess, and taking vitamins.

The least reliable items over time are participating in organized demonstrations and being a guest in a teacher's home. It would seem likely that these last two types of behavior are much more dependent upon situational factors than are the other types.

The last two columns of data in Table 5 show the results of the stepwise regression analysis from student input variables. With a few exceptions, responses to these items are more difficult to predict from student input variables than is the student's freshman grade point average. This finding is not surprising, inasmuch as we are dealing with individual items, which tend to be much less reliable than composite scales based on several items.

The results of the regression analyses for the 15 attitudinal items are shown in Table 6. Again, the changes between 1967 and 1968 are shown in the first two columns. Perhaps the most striking feature of these comparative means is the pronounced shift of the students' attitudes in a more liberal direction. These shifts are especially apparent in connection with items having to do with student freedom and power. Thus, students come to agree more with the idea that faculty promotions should be based in part on student evaluations and to agree less that student publications should be cleared by college officials, that college officials have the right to ban persons with extreme views from speaking on campus, and that college faculty are more competent than are students to specify the curriculum. (It should be noted, however, that students as a group are still inclined more to agree than to disagree with this latter item -- a mean score of 2.50 being the dividing line between agree and disagree.) The trend toward greater liberalism is further reflected in the growing skepticism with the

idea that the activities of married women are best confined to the home and family and that the chief benefit of a college education is that you can make more money if you have a degree.

Perhaps, the only inconsistent finding with respect to the general trend toward liberalism concerns the item "most college officials have been too lax in dealing with student protests on campus." The mean student response to this item showed almost no change over the one-year interval. However, it is worth noting that the variation in responses increased somewhat over the same interval. That is, students were more inclined to agree or disagree strongly with this item in 1968 than they were in 1967. This finding would suggest growing polarization of student attitudes concerning the matter of campus unrest.

The results of the comparative analysis of college impact are presented in Table 7. Since the results for public and private two-year colleges were very similar, we have reported only one set of results for these colleges. Also, in order to conserve space, we have reported results for only two of the four groups of four-year colleges -- Roman Catholic and Protestant (public and private-nonsectarian colleges were found to have significant effects on only a few of the outcomes).

By scanning the column under any type of college, you can see the particular pattern of effects that the college had on the various dependent variables. The two-year colleges, for example, have a negative impact on student drinking and smoking and a positive impact on relatively conservative student attitudes. By scanning any given row next to one of the items, it is possible to see how student performance on that item is affected by different types of colleges. The frequency with which students engage in

discussions about religion, for example, is positively affected by attendance at a Roman Catholic or Protestant college and negatively affected by attendance at a technological institution or public university. One of the most interesting patterns of effects can be observed in the public universities. First, there are several effects indicating relatively lowered motivation for academic pursuits: negative effects on typing homework assignments and doing extra reading for courses and positive effects on oversleeping and missing a class or appointment. Similarly, there are negative effects on being a guest in a teacher's home and asking a teacher for advice after class (possibly these last two effects are a result of the university's large size, which limits the amount of personal contact between faculty and students). At the same time, the public universities strengthen students' beliefs that organized sports should be de-emphasized and that faculty promotions should be based in part on student evaluations. And, as we have already noted, the public universities have a negative impact on the student's freshman GPA. Considering this pattern of effects on student attitudes, behavior, and achievement, it is remarkable that public universities have a positive impact on the student's degree of satisfaction with his college. A possible clue to this apparent contradiction may reside in the diverse curriculum of the typical public university. Some other studies currently in progress at the Council indicate that one of the prime determinants of student satisfaction is the diversity of the college curriculum and the ease with which students can experiment with different courses and change their major field of study.

The private universities produce a pattern of effects that is both similar and different to that of the public universities. Like the public

universities, the private ones have a positive impact on oversleeping and missing a class or appointment, a negative impact on being a guest in a teacher's home, and a positive impact on the student's satisfaction with the college. However, attendance at a private university increases the student's chances of participating in organized demonstrations, whereas attendance at a public university decreases his chances. This negative effect of the public universities on participation in demonstrations may be the result of the sheer size of these institutions. Even though public universities have more demonstrations than other types of public and private institutions (Bayer and Astin, 1970), the chances of any given student's participating are apparently reduced. Possibly, this effect is again the result of the large size of these institutions, where a given student's opportunity to participate in any kind of organized institutional activity is relatively slight.

The pattern of effects for technological institutions is striking in its consistency. Attendance at a technological institution reduces the frequency of nearly every type of student behavior, including various types of student interaction as well as interaction between students and faculty. The only exception to this negative effect concerns the item "failed to complete a homework assignment on time," which was positively affected at the technological institutions. Possibly this finding reflects the heavy academic workload that is characteristic of many technological institutions. Such academic pressure might also be an important factor in three other effects of the technological institution: decreasing the student's chances of returning for a second year, lowering his freshman GPA, and making him dissatisfied with the college.

In many ways, the typology of the institutions used in this particular study is probably too crude and likely to mask many important differential effects of institutions. Thus, there are probably many important environmental differences within a category such as private universities. Such differences would, of course, be confounded by this type of analysis.

Currently in progress are several additional analyses of institutional impact in which we are examining the effects of such institutional variables as size, selectivity, academic competitiveness, peer group interaction, and other environmental features which cut across the categories used in the present study. In these analyses, we hope to be able to identify specific environmental characteristics that affect the student's intellectual and personal development.

Table 1

Progress of the American Council on Education's
Cooperative Institutional Research Program Between 1965 and 1970

Year of Entering Freshman Class (cohort)	Number of Participating Institutions	Number of Entering Freshmen Students Who Completed Questionnaires	Year of Longitudinal Follow-ups			
			1967	1968	1969	1970
1965 (pilot)	61	42,061				
1966	307	254,480	x		x	x
1967	359	280,650		x	x	
1968	435	301,488			x	
1969	390	260,061			x	
1970	425	272,268				

Table 2
Institutions and Students Participating in the
1967-1968 Longitudinal Analyses

Type of Institution	Number	Number of Students
Public two-year colleges	4	503
Private two-year colleges	8	912
Technological institutions	13	1,494
Public four-year colleges	15	2,321
Roman Catholic four-year colleges	27	3,438
Protestant four-year colleges	30	4,203
Private-nonsectarian four-year colleges	43	6,875
Public universities	18	3,374
Private universities	21	3,686
(Total)	(179)	(26,806)

Table 3

Stepwise Prediction of Freshman Grade Point Average (GPA)
From Pre-College Input Variables
(N=5,351 Students)

Step	Input Variable Entering Regression Equation	R	F-ratio in Final Regression Equation	Sign of Coefficient	Zero-order Correlation of Input Variable with Freshman GPA
1.	High school grades	.515	981.1	+	.51
2.	Aptitude test score	.525	111.6	+	.37
3.	Religious affiliation (reason for choosing college)	.529	34.7	+	.05
4.	Academic reputation (reason for choosing college)	.533	22.5	-	.11
5.	Age	.535	24.1	+	-.06
6.	Own my own business (life goal)	.538	22.9	-	-.16
7.	Expect to transfer before graduating	.540	20.9	+	.02
8.	Expect to dropout before graduating	.542	17.7	-	-.04
9.	Organized sports should be deemphasized	.543	11.8	+	.13
10.	Develop a philosophy of life (life goal)	.545	12.0	+	.12
11.	To live away from home (reason for choosing col- lege)	.546	14.6	-	.03
12.	Low cost (reason for choosing college)	.547	12.0	+	-.04
13.	Jewish (religious prefer- ence)	.549	10.8	+	.07
14.	Engineering major	.550	10.8	-	-.03
15.	Biological sciences major	.551	9.7	-	-.01

Table 4
Expected and Actual Freshman Grade Point Averages of
Students in Different Types of Institutions

Type of Institution	Mean Freshman GPA ^a		
	Actual	Expected	Actual minus Expected
Public two-year colleges	2.51	2.32	.19***
Private two-year colleges	2.42	2.28	.14***
Technological institutions	2.53	2.64	-.11***
Public four-year colleges	2.45	2.46	-.01
Roman Catholic four-year colleges	2.66	2.61	.05***
Protestant four-year colleges	2.55	2.57	-.02
Private-nonsectarian four-year colleges	2.64	2.67	-.03**
Public universities	2.50	2.55	-.05***
Private universities	2.71	2.69	.02

^aBased on 4-point scale: A=4, B=3, C=2, D=1, F=0.

** p < .01.

*** p < .001.

Table 5
Prediction of 28 Freshman Year Behaviors from Pre-College Input Data
(N=5,351 Students)

Behavioral Item	Mean Score ^a		Correlation Between Responses in 1967 and 1968	Stepwise Prediction From Student Input Variables ^b	
	1967	1968		Final R	No. Variables Entering Regression
Overslept and missed a class or appointment	1.19	1.59	.24	.414	19
Typed a homework assignment	2.13	2.27	.41	.473	15
Participated in organized demonstrations	1.19	1.27	.22	.428	23
Failed to complete a homework assignment on time	1.76	1.60	.34	.390	18
Argued with a teacher in class	1.67	1.57	.44	.508	22
Was a guest in a teacher's home	1.47	1.33	.18	.352	18
Rode on a motorcycle	1.61	1.42	.45	.477	14
Slept or dozed in class	1.51	1.56	.45	.461	11
Studied with other students	2.16	2.28	.28	.323	13
Did extra (unassigned) reading for a course	1.97	1.80	.35	.397	17
Took sleeping pills	1.07	1.08	.34	.364	11
Tutored another student	1.64	1.64	.31	.357	17
Played chess	1.51	1.30	.50	.547	13
Saw a foreign movie	1.67	1.70	.34	.435	20
Took a tranquilizing pill	1.12	1.12	.37	.399	10
Discussed religion	2.34	2.29	.39	.453	16
Took vitamins	1.85	1.66	.50	.512	8
Visited an art gallery or museum	1.88	1.69	.33	.423	22
Took a trip of more than 500 miles	1.80	1.57	.26	.321	13
Got a traffic ticket	1.18	1.14	.25	.354	13
Missed school because of illness	1.80	1.51	.26	.352	12
Smoked cigarettes	1.52	1.71	.71	.716	7
Discussed politics	2.19	2.31	.46	.520	17
Played tennis	1.71	1.68	.42	.430	10
Drank beer	1.64	1.91	.56	.589	15
Played bridge	1.20	1.25	.46	.488	13
Discussed sports	2.30	2.13	.61	.648	17
Asked a teacher for advice after class	2.23	2.09	.31	.359	16

^aResponses are scored 3 ("Frequently"), 2 ("Occasionally") or 1 ("Not at all").

^bInput variables were entered into regression in stepwise fashion until no additional variable was capable of producing a reduction in the residual sum of squares exceeding $p = .05$.

Table 6

Prediction of Student Attitudes About 15 Issues From Pre-College Input Data

(N = 5,351 Students)

Attitudinal Item	Mean Score ^a		Correlation Between Responses in 1967 and 1968	Stepwise Prediction From Student Input Variables ^b	
	1967	1968		Final R	No. Variables Entering Regression
College faculty are more competent than are students to specify the curriculum	3.18	2.84	.23	.325	17
The activities of married women are best confined to the home and family	2.50	2.21	.51	.570	18
Parents should be discouraged from having large families	2.30	2.38	.53	.561	13
Colleges would be improved if organized sports were de-emphasized	1.93	1.95	.44	.510	23
Scientists should publish their findings regardless of the possible consequences	2.43	2.52	.36	.372	10
Realistically, an individual person can do little to bring about changes in our society	2.05	2.16	.30	.347	15
The chief benefit of a college education is that it increases one's earning power	2.35	2.13	.45	.527	24
My beliefs and attitudes are similar to those of most other college students	2.68	2.60	.37	.427	18
Faculty promotions should be based in part on student evaluations	2.65	2.91	.34	.382	16
Student publications should be cleared by college officials	2.34	2.03	.44	.518	19
Women should be subject to the draft	1.81	1.82	.52	.531	8
The voting age should be lowered to 18	2.83	3.15	.49	.521	12
College officials have the right to ban persons with extreme views from speaking on campus	2.12	1.87	.40	.493	22
Students from disadvantaged social backgrounds should be given preferential treatment in college admissions	2.23	2.23	.34	.400	14
Most college officials have been too lax in dealing with student protests on campus	2.38	2.36	.40	.490	20

^aResponses are scored 4 (Agree strongly), 3 (Agree somewhat), 2 (Disagree somewhat), 1 (Disagree strongly).

^bInput variables were entered into regression in stepwise fashion until on additional variable was capable of producing a reduction in the residual sum of squares exceeding $p = .05$.

Table 7

Effects of Six Types of Institutions on Student Attitudes and Behavior

Dependent Variable	Two- Year Col- leges	Techno- logical Institu- tions	Roman Catholic 4-year Colleges	Protes- tant 4-year Colleges	Public Univer- sities	Private Univer- sities
Behaviors						
Overslept and missed a class or appointment.....	-	-	-		+	+
Typed a homework assignment.....		-	+	-	-	
Participated in organized demonstrations.....		-			-	+
Failed to complete a homework assignment on time.....	+	+	-	+		
Was a guest in a teacher's home.....		-	-	+	-	-
Rode on a motorcycle.....					+	
Slept or dozed in class.....		-				
Studied with other students.....			+			
Did extra (unassigned) reading for a course.....			+		-	
Tutored another student.....				+		
Saw a foreign movie.....				-	-	-
Took a tranquilizing pill.....					+	
Discussed religion.....		-	+	+	-	
Took vitamins.....					+	
Visited an art gallery or museum.....				-		+
Took a trip of more than 500 miles.....				-	-	
Got a traffic ticket.....		-		-	+	
Missed school because of illness.....			-			
Smoked cigarettes.....	-					
Discussed politics.....		-				
Played tennis.....			-	+	-	-
Drank beer.....	-	-	+		+	
Discussed sports.....				+		
Asked a teacher for advice after class.....		-			-	
Attitudes						
College faculty are more competent than are students to specify the curriculum.....						+
Parents should be discouraged from having large families....			-			
Colleges would be improved if organized sports were de-emphasized.....					+	
Scientists should publish their findings regardless of the possible consequences.....			-			
Realistically, an individual person can do little to bring about changes in our society.....					+	
The chief benefit of a college education is that it increases one's earning power.....					+	
My beliefs and attitudes are similar to those of most other college students.....		-	+			
Faculty promotions should be based in part on student evaluations.....					+	
Student publications should be cleared by college officials.....	+			+		+
College officials have the right to ban persons with extreme views from speaking on campus.....	+	+	+			
Students from disadvantaged social backgrounds should be given preferential treatment in college admissions.....				-		
Most college officials have been too lax in dealing with student protests on campus.....	+					
Returned for a second year.....		-	+			
Freshman grade point average.....	+	-	+		-	
Satisfied with college.....		-	-		+	+

NOTE: A plus sign (+) indicates that the mean expected score was significantly ($p < .05$) lower than the mean actual score; a minus (-) sign indicates that the mean expected score was significantly higher than the mean actual; a blank indicates that the two scores were not significantly different.